

In the Claims

1. (Currently amended): A method of forming a local interconnect, comprising:

providing a bulk semiconductor substrate having a first conductivity type background region, an adjacent second conductivity type background region and a boundary extending therebetween;

forming an isolation trench within the bulk semiconductor substrate laterally centered over and along the boundary;

depositing a first trench isolation material over the bulk semiconductor substrate and to within the isolation trench;

chemically etching the first trench isolation material effective to form a line trench within the first trench isolation material at least a portion of which is laterally centered within the isolation trench and laterally centered over the boundary;

depositing conductive material within the line trench and recessing it within the line trench after depositing it;

depositing a second trench isolation material the same as the first trench isolation material over the first trench isolation material, over the recessed conductive material within the isolation trench and within the line trench; and

removing at least some first and second trench isolation material from the semiconductor substrate in at least one common removing step.

2. (Original): The method of claim 1 wherein the at least one common removing step comprises CMP.

3. (Currently amended): The method of claim 1 wherein the ~~forming~~ depositing conductive material within the line trench comprises depositing at least two different composition conductive materials to within the line trench.

4. (Currently amended): The method of claim 1 wherein the line trench in the first trench isolation material does not extend to ~~an edge of the trench isolation material~~ proximate active area substrate material, and further comprising after the removing:

forming insulative material over the first and second trench isolation materials and over the conductive material;

etching a contact opening into the insulative material which bridges over and between said active area substrate material and said conductive material; and

forming a conductor within the contact opening which electrically connects said conductive material with said active area substrate material.

5. (Currently amended): A method of forming a local interconnect, comprising:
forming an isolation trench within a semiconductor substrate;
depositing a first trench isolation material over the semiconductor substrate and
to within the isolation trench;

removing first trench isolation material effective to form a line trench within the
first trench isolation material into a desired local interconnect configuration;

forming conductive material within the line trench;

depositing a second trench isolation material over the first trench isolation
material, over the conductive material within the isolation trench and within the line
trench; and

removing at least some first and second trench isolation material from the
semiconductor substrate in at least one common removing step.

6. (Currently amended): The method of claim 5 wherein the semiconductor
substrate comprises a bulk monocrystalline substrate, and the isolation trench is formed
in bulk monocrystalline substrate material.

7. (Original): The method of claim 5 wherein the first and second trench isolation
materials are the same in composition.

8. (Original): The method of claim 5 wherein the first and second trench isolation materials are different in composition.

9. (Original): The method of claim 5 wherein the removing of the first trench isolation material to form the line trench comprises chemical etching.

10. (Original): The method of claim 5 wherein the at least one common removing step comprises CMP.

11. (Original): The method of claim 5 wherein the forming conductive material within the line trench comprises depositing conductive material and recessing it within the line trench after the depositing.

12. (Original): The method of claim 5 wherein the forming conductive material within the line trench comprises depositing at least two different composition conductive materials to within the line trench.

13. (Currently amended): A method of forming a local interconnect, comprising:
forming an isolation trench within semiconductive material of a semiconductor substrate, the semiconductive material having an outer surface;
depositing a trench isolation material over the semiconductor substrate and to within the isolation trench;
removing trench isolation material from within the isolation trench effective to form a line trench within the trench isolation material into a desired local interconnect configuration, the line trench having a base which is lower than the outer surface;
forming first conductive material to within the line trench to form a conductive lining within the line trench; and
depositing a second conductive material different from the first conductive material to within the line trench on the conductive lining.

14. (Original): The method of claim 13 wherein the removing forms at least a portion of the line trench to be laterally centered between sidewalls of the isolation trench in at least one cross section.

15. (Original): The method of claim 13 comprising covering the second conductive material with insulative material the same as the trench isolation material.

16. (Currently amended): The method of claim 15 wherein at least some of the insulative material is received within the line trench and on the first conductive material.

17. (Currently amended): A method of forming a local interconnect, comprising:
forming an isolation trench within semiconductive material of a semiconductor substrate, the semiconductive material having an outer surface;

depositing a trench isolation material over the semiconductor substrate and to within the isolation trench;

removing trench isolation material from within the isolation trench effective to form a line trench within the trench isolation material into a desired local interconnect configuration, the line trench having a base which is lower than the outer surface;

forming an oxidation resistant liner material to within the line trench to form an oxidation resistant lining within the line trench; and

depositing conductive material to within the line trench on the oxidation resistant lining.

18. (Original): The method of claim 17 wherein the oxidation resistant liner material is insulative.

19. (Original): The method of claim 17 wherein the oxidation resistant liner material is conductive.

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20. (Original): The method of claim 17 wherein the removing forms at least a portion of the line trench to be laterally centered between sidewalls of the isolation trench in at least one cross section.

21. (Original): The method of claim 17 comprising covering the conductive material with insulative material the same as the trench isolation material.

22. (Original): The method of claim 21 wherein at least some of the insulative material is received within the line trench and on the conductive material.

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23. (Currently amended): A method of forming a local interconnect, comprising:
forming an isolation trench within semiconductive material of a semiconductor substrate, the semiconductive material having an outer surface, the isolation trench having opposing longitudinal sidewalls in at least one cross section;
depositing a trench isolation material over the semiconductor substrate and to within the isolation trench;
removing trench isolation material from within the isolation trench effective to form a line trench within the trench isolation material into a desired local interconnect configuration which is laterally centered between the opposing isolation trench sidewalls in the one cross section, the line trench having a base which is lower than the outer surface; and
forming conductive material to within the line trench; and
after forming the conductive material, forming insulative material within the line trench below the outer surface.

24. (Original): The method of claim 23 wherein the forming conductive material within the line trench comprises depositing conductive material and recessing it within the line trench after the depositing.

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25. (Original): The method of claim 23 wherein the forming conductive material within the line trench comprises depositing at least two different composition conductive materials to within the line trench.

26. (Currently amended): The method of claim 23 wherein the semiconductor substrate comprises a bulk monocrystalline substrate, and the isolation trench is formed in bulk monocrystalline substrate material.

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27. (Currently amended): A method of forming a local interconnect, comprising:
providing a bulk semiconductor substrate having a first conductivity type background region, an adjacent second conductivity type background region and a boundary extending therebetween, the bulk semiconductor substrate having an outer surface;

forming an isolation trench within semiconductive material of the bulk semiconductor substrate over and along the boundary;

depositing a trench isolation material over the bulk semiconductor substrate and to within the isolation trench;

removing trench isolation material from within the isolation trench effective to form a line trench within the trench isolation material into a desired local interconnect configuration, the line trench having a base which is lower than the outer surface; and

forming conductive material to within the line trench; and
after forming the conductive material, forming insulative material within the line trench below the outer surface.

28. (Original): The method of claim 27 comprising forming the isolation trench to be laterally centered over the boundary.

29. (Original): The method of claim 27 comprising forming the line trench to be laterally centered over the boundary.

30. (Original): The method of claim 27 comprising forming the isolation trench and the line trench to be laterally centered over the boundary.

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31. (Original): The method of claim 27 comprising forming the line trench to be laterally centered between longitudinal sidewalls of the isolation trench in at least one cross section.

32. (Currently amended): A method of forming a local interconnect comprising:
etching a line trench into a desired line configuration into trench isolation material formed relative to an outer surface of semiconductive material of a semiconductor substrate, the line trench in the trench isolation material not extending to an edge of the trench isolation material proximate active area substrate material, the line trench having an insulative base which is lower than the outer surface; and
forming conductive material over the semiconductor substrate which at least partially fills the trench.

33. (Currently amended): The method of claim 32 wherein the semiconductor substrate comprises a bulk monocrystalline substrate, and the isolation trench is formed in bulk monocrystalline substrate material.

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34. (Original): The method of claim 32 wherein the forming conductive material within the line trench comprises depositing conductive material and recessing it within the line trench after the depositing.

35. (Original): The method of claim 32 wherein the forming conductive material within the line trench comprises depositing at least two different composition conductive materials to within the line trench.

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36. (Currently amended): A method of forming a local interconnect comprising:
etching a line trench into a desired line configuration within trench isolation
material formed relative to an outer surface of semiconductive material of a
semiconductor substrate, the line trench in the trench isolation material not extending to
~~an edge of the trench isolation material proximate active area substrate material,~~ the
line trench having an insulative base which is lower than the outer surface;

forming conductive material over the semiconductor substrate which at least
partially fills the line trench;

forming insulative material over the trench isolation material and over the
conductive material;

etching a contact opening into the insulative material which bridges over and
between said active area substrate material and said conductive material; and

forming a conductor within the contact opening which electrically connects said
conductive material with said active area substrate material.

37. (Original): The method of claim 36 wherein the forming conductive material
within the line trench comprises depositing conductive material and recessing it within
the line trench after the depositing.

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38. (Original): The method of claim 36 wherein the forming conductive material within the line trench comprises depositing at least two different composition conductive materials to within the line trench.

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39. (Currently amended): The method of claim 36 wherein the semiconductor substrate comprises a bulk monocrystalline substrate, and the isolation trench is formed in bulk monocrystalline substrate material.
